BY ORDER OF THE COMMANDER AIR FORCE SPECIAL OPERATIONS COMMAND

AIR FORCE SPECIAL OPERATIONS COMMAND INSTRUCTION 15-101

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Weather

AFSOC WEATHER OPERATIONS

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This instruction implements Air Force Policy Directive (AFPD) 15-1, *Air Force Weather Operations*, and complements Air Force Instruction (AFI) 15-128, *Air Force Weather Operations - Roles and Responsibilities*. It establishes guidance for Air Force Special Operations Command (AFSOC) weather operations. This instruction applies to all active duty and AFSOC-gained Air National Guard (ANG) and Air Force Reserve Command (AFRC) weather units and personnel. This publication may be supplemented at any level. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at **https://www.my.af.mil/afrims/afrims/afrims/rims.cfm**. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force (AF) Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, Publications and Forms Management, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items.

SUMMARY OF CHANGES

This document has been revised to reflect appropriate tier waiver authority in accordance with AFI 33-360, Table 1.1.(Tier Waiver Authorities) and requires a cursory review. This supplement provides AFSOC guidance to procedures and policies.

Chapter 1

INTRODUCTION

1.1. Scope. This instruction, in conjunction with United States Air Force (USAF), United States Special Operations Command (USSOCOM) and other AFSOC publications, establishes responsibilities and direction for all AFSOC weather organizations.

1.2. Concept of operations. The Air Force and USSOCOM direct AFSOC to dedicate weather forces for AFSOC, US Army Special Operations Command (USASOC) and joint operations. These forces provide products and conduct weather operations across a broad spectrum of USSOCOM's core tasks. Weather operations range from centrally produced meteorological products to target specific mission forecasts for Special Operations Forces (SOF).

1.3. Roles and Responsibilities.

1.3.1. **Headquarters (HQ) AFSOC/A3OW.**

1.3.1.1. Serves as the Senior METOC Officer (SMO) for USSOCOM.

1.3.1.2. Serves as focal point for weather operational requirements, concepts, procedures and issues within AFSOC, USASOC, and on behalf of USSOCOM.

1.3.1.3. Develops AFSOC-unique policies for weather operations which fall outside of applicable Air Force (AF) 15-series directives.

1.3.1.4. Is responsible for performing duties as the USASOC Staff Weather Officer (SWO).

1.3.1.5. Serves as the MAJCOM functional manager for manning, assignments, utilization and personnel management issues for 1W0X1, and 1W0X2 enlisted career fields, and 15WX career field.

1.3.1.6. Serves as the weather Functional Area Manager (FAM) providing input to the War and Mobilization Plan (WMP), Operational Plans (OPLAN), and Contingency Plans (CONPLAN).

1.3.1.7. Develops/validates Designed Operational Capability (DOC) statements for weather units/organizations.

1.3.1.8. Validates Unit Type Codes (UTC) containing weather personnel and/or equipment.

1.3.1.9. Provides technical direction and support for weather related issues.

1.3.1.10. Provides functional oversight on all-weather issues in Memorandums of Agreement (MOA) between AFSOC and non-AFSOC organizations.

1.3.1.11. Serves as focal point for all SOF-unique weather equipment, contracts, and programs.

1.3.1.12. Evaluates weather operations and conducts staff assistance visits to weather units, organizations and elements.

1.3.1.13. Prepares weather concept of operation (CONOP) documents.

1.3.1.14. Develops and validates weather training requirements.

1.3.1.15. Provides oversight of subordinate unit Mission Essential Task Lists (METL).

1.3.1.16. Develops command policy and guidance for career field training requirements.

1.3.1.17. Serves as Battlefield Airman lead organization for SOWT.

1.3.1.18. Ensures requirements for weather operations are represented from the planning phase through the execution phase of CJCS, USSOCOM, other Unified Combatant Commander-directed, and AF, AFSOC and USASOC-sponsored exercises and training events

1.3.2. **Special Operations Wing (SOW), and Special Operations Group (SOG).**

1.3.2.1. Conducts weather operations and training.

1.3.2.2. Assists in the development of tactics, techniques and procedures (TTPs) for weather operations.

1.3.2.3. Identifies and submits weather manpower, training, and equipment requirements and shortfalls through command lines for resolution.

1.3.2.4. Provides oversight of subordinate units' METL.

1.3.2.5. Manages UTCs when designated as the pilot unit.

1.3.3. **Special Tactics Group (STG).**

1.3.3.1. Conducts SOWT operations and training.

1.3.3.2. Assists in development of SOWT TTPs.

1.3.3.3. Identifies and submits weather manpower, training, and equipment requirements and shortfalls through command lines for resolution.

1.3.3.4. Provides oversight of subordinate unit METL.

1.3.3.5. Manages UTCs when designated as the pilot unit.

1.3.3.6. Provides oversight of subordinate unit ARMS and CMR task lists.

1.3.4. **Weather units, organizations, elements, and personnel.**

1.3.4.1. Perform duties IAW AFI 15-128, and other applicable AF 15-series instructions.

1.3.4.2. Understand USSOCOM's and AFSOC's unique missions, core tasks and core mission areas.

1.3.4.3. Leverage SOF-unique equipment to perform weather core processes and procedures-collect, analyze, predict, tailor, apply and integrate.

1.3.4.4. Develop METL.

1.3.4.5. Coordinate exercise requirements and objectives against developed METL and AF Weather Universal Joint Task List through their chain of command to AFSOC for incorporation into the exercise planning process.

1.3.4.6. Accomplish post exercise or deployment After Action Reports IAW local guidance with courtesy copy to HQ AFSOC/A3OW NLT 10 days from end of exercise or deployment.

1.4. Waivers. Units may request waivers to this instruction due to unique mission needs.

1.4.1. Forward requests by letter or message through the chain of command to AFSOC/A3. The request will include a description of the unique condition, conflicting requirement and the rationale for the waiver. **(T-3)**

1.4.2. If approved, a waiver remains in effect for the life of this publication, unless HQ AFSOC/A3 specifies a shorter period of time, cancels the waiver in writing or publishes a change that alters the basis for the waiver.

Chapter 2

OPERATIONS

2.1. Forms.

2.1.1. When providing flight weather briefings AFSOC weather personnel may use the DD Form 175-1, *Flight Weather Briefing*, AFSOC Form 87, *AFSOC Flight Weather Briefing* or other locally produced format. When briefing USASOC flying units, the DD Form 175-1, *Flight Weather Briefing*, will be used unless another format is approved by the mission commander. For instructions on the use of the AFSOC Form 87, refer to Attachment 2 of this instruction. **(T-2)**

2.1.2. When providing tactical environmental reconnaissance (TERREP), weather personnel will utilize AFSOC Form 86, *Tactical Environmental Reconnaissance Report (TERREP)* or locally developed guidance. For instructions on the use of the AFSOC Form 86, refer to Attachment 4 of this instruction. **(T-3)**

2.1.3. When accomplishing a weather site survey, weather personnel will utilize AFSOC Form 84, *Weather Facility Site Survey Form*, or locally developed guidance. For instructions on the use of the AFSOC Form 84, refer to Attachment 3 of this instruction. **(T-3)**

2.1.4. When accomplishing a riverine assessment weather personnel will utilize AFSOC Form 85, *Tactical Riverine Assessment*, or locally developed guidance. For instructions on the use of the AFSOC Form 85, refer to Attachment 5 of this instruction. **(T-3)**

2.2. Chain of Command versus Functional Management. Understanding the difference between the two is vitally important for effective and efficient deployed weather operations.

2.2.1. JP 1-02, *DOD Dictionary of Military and Associated Terms*, defines Chain of Command as the succession of commanding officers from a superior to a subordinate through which command is exercised. Authority to command forces is established via formal orders passed down from higher commands and enables commanders to organize and employ forces to accomplish the command's assigned mission (i.e., OPCON).

2.2.2. Functional Management describes the processes and procedures deployed METOC forces use to coordinate operations to accomplish their METOC mission in support of the commander's objectives. The Senior METOC Officer (SMO) establishes the functional objectives for deployed METOC forces. Functional management is exercised through the Joint METOC Officer (JMO) for the deployed AO. The processes and procedures for METOC functional management will be published by the SMO and/or JMO via instructions (LOI), annexes to plans or other written guidance. Functional management lines usually mirror the chain of command within a deployed location. However, command authority is not provided or implied within the functional management responsibilities of the SMO or JMO. **(T-3)**

2.3. Missions and Organization.

2.3.1. Guidance on Joint Task Force, Joint Special Operations Task Force (JSOTF), Theater Special Operations Command METOC operations as well as Joint METOC Officer duties are found in JP 3-59, *Meteorological and Oceanographic Operations*.

2.3.2. Joint Special Operations Aviation Component (JSOAC) METOC operations. In most cases the JSOAC is subordinate to a JSOTF or a theater Joint Force Special Operations Component (JFSOC). Command and control of AFSOC weather personnel assigned to a JSOAC may be exercised by the JSOAC Commander (JSOACC). The JSOACC is responsible for planning, coordinating and executing joint special operations air activities; and may include STS and many SOWT activities. The JSOAC METOC officer provides functional management for SOF aviation weather forces subordinate to JSOAC command authority. He/she also provides SWO duties for the JSOAC staff, leads the JSOAC METOC operations within the J-3 (operations) section and liaisons with METOC personnel.

2.3.3. AFSOC weather personnel may also deploy as members of units subordinate to JSOTFs or JSOACs (i.e., Expeditionary Special Operations Wing [ESOW] or Expeditionary Special Tactics Squadron [ESTS]). AFSOC weather personnel need to be familiar with the duties associated with METOC operations at these levels and their interdependency with METOC levels both horizontally and vertically across the battlefield and the spectrum of warfare.

2.4. Replacement Procedures for Loss/Damaged Equipment.

2.4.1. HQ AFSOC/A3OW will be coordinated with in the event of lost or damaged AF Weather (AFW) equipment. AFW equipment includes systems centrally managed by the Air Force Weather Agency (AFWA) or contracted by an AF program management office to repair or replace AF damaged or lost equipment. Units will not directly liaison with AFWA or any other agency, contractor, or other entity without first notifying HQ AFSOC/A3OW. If a weather unit cannot reach HQ AFSOC/A3OW in a timely manner (i.e. weekends, overseas time differences, etc.), then the unit may liaison directly with AFWA for routine weather equipment maintenance issues as long as HQ AFSOC/A3OW is notified shortly thereafter. A Trouble Ticket may be opened via the AFWA Help Desk for AF equipment repair or maintenance issues. If the equipment is SOF peculiar (USSOCOM funded) or OPSEC sensitive, it may be accounted for, as required, using the Special Tactics Equipment Module in lieu of the CA/CRL (R-14). AFSOC weather units should check with their equipment manager/POC for the preferred method. **(T-3)**

2.4.2. HQ AFSOC/A3OW will coordinate with AFWA to replace or repair AFW equipment.

2.4.3. AFSOC weather units may be responsible for shipping damaged AFW equipment to a central repair or contractor facility. HQ AFSOC/A3OW will liaison with AFWA for equipment-specific shipping instructions. Contact HQ AFSOC/A3OW for SOF equipment repair or replacement.

2.4.4. The following equipment information will be provided to HQ AFSOC/A3OW, when reporting lost or damaged equipment. **(T-3)**

2.4.4.1. Equipment name/nomenclature/serial number.

2.4.4.2. Current equipment location.

2.4.4.3. What is damaged and how was it damaged.

2.4.4.4. If lost, a Report of Survey (ROS) must be completed and courtesy copied to HQ AFSOC/A3OW.

2.5. Metrics

2.5.1. All AFSOC weather units will maintain a metrics program to systematically document the performance of in-garrison weather services.

2.5.2. Metrics will be provided to HQ AFSOC/A3OW on a quarterly basis. **(T-3)**

J. MARCUS HICKS, Brigadier General, USAF
Director of Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms,* 8 Nov 2010

Joint Publication 3-05, *Doctrine for Joint Special Operations,* 18 Apr 2011

Joint Publication 3-59, *Meteorological and Oceanographic Operations,* 7 Dec 2012

AFI 10-206, *Operational Reporting,* 6 Sep 2011

AFI 15-128, *Air and Space Weather Operations - Roles and Responsibilities,* 7 Feb 2011

AFI 15-135V3, *Special Operations Weather Team Operations,* 13 Jul 2010

AFMAN 15-111, *Surface Weather Observations,* 27 Feb 2013

AFMAN 15-124, *Meteorological Codes,* 28 Feb 2013

AFMAN15-129, Vol 1, *Air and Space Weather Operations - Characterization,* 6 Dec 2011

AFMAN 15-129, Vol 2, *Air and Space Weather Operations - Exploitation,* 7 Dec 2011

Prescribed Forms

AFSOC Form 84, *Weather Facility Site Survey Form*.

AFSOC Form 85, *Tactical Environmental Reconnaissance Report (TERREP)*

AFSOC Form 86, *Tactical Riverine Assessment*,

AFSOC Form 87, *AFSOC Flight Weather Briefing*

Adopted Forms

Air Force Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AAR—After-Actions Report

ADCON—Administrative Control

AO—Area of Operations

AFSOC—Air Force Special Operations Command

AFSOF—Air Force Special Operations Forces

ARSOA—Army Special Operations Aviation

ARSOF—Army Special Operations Forces

CONOPS—Concept of Operations

CONPLAN—Concept Plan

ESOG—Expeditionary Special Operations Group

ESOS—Expeditionary Special Operations Squadron

ESOW—Expeditionary Special Operations Wing

ESTG—Expeditionary Special Tactics Group

ESTS—Expeditionary Special Tactics Squadron

JMO—Joint METOC Officer

JSOAC—Joint Special Operations Air Component

JSOTF—Joint Special Operations Task Force

JTF—Joint Task Force

METOC—Meteorological and Oceanographic

OPCON—Operational Control

OPLAN—Operations Plan

OPORD—Operations Order

PMSV—Pilot to Metro Service

SAV—Staff Assistance Visit

SFG—Special Forces Group

SITREP—Situation Report

SMO—Senior METOC Officer

SOF—Special Operations Forces

SOG—Special Operations Group

SOP—Standing Operating Procedure

SOTF—Special Operations Task Force

SOW—Special Operations Wing

SOWT—Special Operations Weather Team

STG—Special Tactics Group

STS—Special Tactics Squadron

SWO—Staff Weather Officer

TACON—Tactical Control

USASOC—United States Army Special Operations Command

USSOCOM—United States Special Operations Command

UCC—Unified Combatant Command

UTC—Unit Type Code

Terms

Administrative Control (ADCON)—Direction or exercise of authority over subordinate or other organizations in respect to administration and support, including organization of Service forces, control of resources and equipment, personnel management, unit logistics, individual and unit training, readiness, mobilization, demobilization, discipline, and other matters not included in the operational missions of the subordinate or other organizations.

Operational Control (OPCON)—Command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority) and may be delegated within the command. When forces are transferred between combatant commands, the command relationship the gaining commander will exercise (and the losing commander will relinquish) over these forces must be specified by the Secretary of Defense. Operational control is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions; it does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training.

Tactical Control (TACON)—Command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed direction and control of movements or maneuvers within the operational area necessary to accomplish missions or tasks assigned. Tactical control is inherent in operational control. Tactical control may be delegated to, and exercised at any level at or below the level of combatant command. When forces are transferred between combatant commands, the command relationship the gaining commander will exercise (and the losing commander will relinquish) over these forces must be specified by the Secretary of Defense. Tactical control provides sufficient authority for controlling and directing the application of force or tactical use of combat support assets within the assigned mission or task.

METOC Domain Authority—The lead METOC office or position sanctioned to define the authoritative METOC data source(s) for a given natural environmental domain (e.g. oceanographic, atmospheric, space and AOR)

Attachment 2

AFSOC FORM 87, FLIGHT WEATHER BRIEFING INSTRUCTIONS

A2.1. General Instructions. Entries in individual blocks are based on aircrew requirements and the weather situation. Make all time entries in Coordinated Universal Time (UTC). Enter all heights in hundreds of feet. Enter surface as "SFC". Enter data for the duration of the specific mission and the entire route of flight. Brief hazards for the specific mission and enroute generally within 25 miles either side of the route and within 5,000 feet above and below the planned flight level. The numbers in this instruction provide guidance to the corresponding blocks on the attached form. For in-person briefings, give the original to the aircrew and retain a copy for your records. Disposition of the AFSOC Form 87 is three months.

Table A2.1. Data Entry Notes.

Note: 1. If you deviate from form pre-fills (local time/GMT; true/magnetic; MSL/AGL), cross out the pre-filled entry and clearly mark the change.
Note: 2. For sections that do not have pre-filled identifiers (MSL/AGL), ensure you clearly identify these entries on the form.

A2.2. Administrative Data.

Table A2.2. Administrative Data Entries.

1. DEPARTURE ICAO/ETD: Enter departure airfield ICAO and estimated time of departure in Zulu. Enter departure grid point or latitude/longitude or other identification for locations that don't have location identifiers.
2. DATE: Enter the date in DD MMM YYYY format.
3. TYPE AIRCRAFT/NUMBER/CALL SIGN: Enter aircraft type (e.g., MH-53, MC-130P, etc.) and call sign, mission number, or the last three digits of the tail number.

A2.3. Takeoff Data.

Table A2.3. Takeoff Data Entries.

1. VALID TIME: Enter valid time as 1 hour either side of estimated time of departure.
2. SKY CONDITION: Enter forecast cloud coverage(s) and cloud base(s) in AGL for takeoff (e.g. SCT050 BKN010).
4. VISIBILITY/WX: Enter forecast visibility in meters (statute miles in CONUS) and the associated weather phenomena for takeoff.
3. WIND (M/T): Enter the surface wind direction in Magnetic for missions departing your airfield, and in True direction for missions departing another airfield. Designate "M" for magnetic" or "T" for true. Enter surface wind direction to the nearest 10 degrees in three digits and surface wind speed (including gust) in two digits (three digits if over 99 knots). Enter "VRB" for a forecast variable wind direction and "CALM" when the winds are forecast calm.
4. TEMP: Enter in Celsius, unless requested in degrees Fahrenheit and mark appropriately. Use corresponding algebraic sign +/-.
5. ALTIMETER SETTING: Using four digits, enter altimeter setting for takeoff location in inches of Mercury (in Hg).
6. PRESSURE ALTITUDE: Enter in feet, with algebraic sign +/-.
7. WARNINGS/ADVISORIES: Enter forecast/observed weather watch, warning or advisory valid for ETD +/-1 hour. When watch, warning and advisory information for a location are not available (e.g., remote briefing) enter "CHECK WITH LOCAL FLIGHT AGENCIES". Inform the aircrew that the status of local weather watches, warnings and/ or advisories is undeterminable, and recommend they check with the local ATC or airfield operations for any weather watches, warnings or advisories that may be in effect.
8. REMARKS: Enter remarks on weather that will affect takeoff and climb (Thunderstorms, icing, turbulence, low level wind shear, etc.). Enter climb winds, if requested in true direction. Enter a representative wind (or winds) from takeoff to cruise altitude. Enter wind direction to the nearest 10 degrees in three digits and wind speed in two or three digits to the nearest 5 knots. Enter climb winds in layers if there are significant differences, (wind speed changes of greater than or equal to 20 knots and/or wind direction changes greater than or equal to 30 degrees and the wind speed is expected to be over 25 knots) from one stratum to another. Ensure the content of the briefing and the Terminal Aerodrome Forecast is consistent.

A2.4. Enroute Data.

Table A2.4. Enroute Data Entries.

1. FLIGHT LEVELS/WIND/TEMPERATURE: Enter flight levels in hundreds of feet. Enter winds in knots to the nearest 10 degrees and nearest 5 knots in a 5 digit format for respective flight levels. Winds will be reported in true direction. Enter temperature in Celsius, unless requested in degrees Fahrenheit for respective flight levels. Identify either AGL or MSL on the form.
2. MAX TEMP/MAX PA: Enter the forecasted max surface temperature in Celsius and pressure altitude in feet, with algebraic sign +/- encountered during the mission.
3. MIN CIG/LOCATION: Enter the minimum ceiling along flight route in hundreds of feet AGL. Enter the location or area where the minimum ceiling will be encountered.
4. THUNDERSTORMS: Enter the name and DTG of the product used (e.g., JMFU/OWS products, radar summary, satellite imagery, NWS or foreign weather service In-Flight Weather Advisories).
5. TURBULENCE: Enter the name and DTG of the product used. Enter the levels in MSL and locations that may impact the flight, 5,000 feet above and below flight level.
6. ICING: Enter the name and DTG of the product used. Check applicable blocks and enter geographical location of icing *not associated with thunderstorms* that may affect the flight. Provide the levels of icing in MSL, include icing 5,000 feet above and below flight level.
7. PRECIPITATION: Enter the type, intensity, character and geographical location of precipitation areas affecting the route or specific mission. This block is for precipitation encountered at flight level, not at the surface, unless the surface is within 5,000 feet of the flight level.

A2.5. Low-level Route/Air Refueling/Orbit/Target Forecast.

Table A2.5. Low-Level Route/Air Refueling/Orbit/Target Forecast Entries.

1. LOCATION/FLT LEVEL: Enter Low Level route, AR, Orbit location identifier, or Lat/Lon and flight level as appropriate.
2. SKY CONDITION: Enter the lowest prevailing condition expected during the valid time in AGL. If TEMPO conditions are expected enter those on the next line. Clouds will be reported with amount of coverage, and base and top (e.g., BKN005/020 or BKN LYRD 005/080). If one area of the route is significantly different from another, divide the area into blocks to accurately reflect the conditions (e.g., N ¾ SCT003/009 S ¼ OVC003/009. While the OVC003 is the lowest, in this example it does not accurately reflect the weather across the route).
3. VISIBILITY/WX: Enter the lowest prevailing VIS condition expected during the valid time along with the weather obscuration. Enter conditions described by a TEMPO group on the next line.
4. WINDS/TEMP: Enter winds to the nearest 10 degrees (direction) and nearest 5 knots (speed) in a 5 digit format. Winds will be reported in true (direction) and knots (speed). Enter the forecast flight level temperature for the respective flight, prefixed with a "+" or "-" as applicable.
5. ALSTG: Enter the lowest altimeter setting expected during the valid period.
6. VALID TIME: For low level, AR, and orbit forecasts, enter as 1 hour before ETA and 1 hour after.

A2.6. Drop/Landing Zone Forecast.

Table A2.6. Drop/Landing Zone Forecast Entries.

1. LOCATION: Enter location identifier or Lat/Lon and drop altitude as appropriate.
2. SKY CONDITION: Enter the lowest prevailing condition expected during the valid time in AGL. If TEMPO conditions are expected enter those on the next line. Clouds will be reported with amount of coverage and base and top (e.g., BKN005/020 or BKN LYRD 005/080).
3. VISIBILITY/WX: Enter the lowest prevailing VIS condition expected during the valid time along with the weather obscuration if any. Enter conditions described by a TEMPO group on the next line.
4. WINDS/TEMP: Enter winds to the nearest 10 degrees (direction) and nearest 5 knots (speed) in a 5 digit format (flight level for drop zone operations, surface for landing zone operations). Winds will be reported in true (direction) and knots (speed). Enter the forecast temperature in Celsius (flight level for drop zone operations, runway temperature for landing zone operations), prefixed with a "+" or "-" as applicable.
5. ALSTG: Enter the lowest altimeter setting expected during the valid period.
6. D-Value or PA: Enter the D-Value for drop zone operations or PA in feet, with algebraic sign +/- for landing zone operations.
7. VALID TIME: For DZ/LZs enter as 1hr before ETA and 1 after ETD.

A2.7. Recovery/Alternate Forecast.

Table A2.7. Recovery/Alternate Forecast Entries.

1. STATION: Enter station identifier.
2. SKY CONDITION: Enter the cloud bases and amounts expected during the valid time (e.g. SCT050 BKN010) in AGL. Enter conditions described by a TEMPO group on the next line or if alternate station weather is required.
3. VISIBILITY/WX: Enter the expected visibility in meters (statute miles in CONUS) and corresponding obscuration to VIS (e.g. 8000 BR).
4. WINDS/TEMP: Enter the magnetic surface wind direction for missions departing the home airfield and returning to the home airfield without landing anywhere else. Encode the true surface wind direction for any airfield other than the home airfield. Encode the true surface wind direction for the home airfield upon landing if the aircraft has landed at another location during the mission. Designate "M" for magnetic" or "T" for true. Enter the forecast temperature in Celsius, prefixed with a “+” or “-” as applicable.
5. ALSTG: Enter the lowest altimeter setting expected during the valid period.
6. PRESSURE ALTITUDE: Enter in feet, with corresponding algebraic sign +/-. If elevation is unknown, annotate “uncorrected” for elevation.
7. VALID TIME: Enter valid time as 1 hour either side of the estimated time of arrival (ETA). When a flight lands at a location during the mission, make one line valid for one hour prior the landing, and a second line valid for one hour prior and after the take-off.

A2.8. Remarks.

Table A2.8. Remarks.

1. REMARKS: Enter any other significant data such as lunar elevation/azimuth impacting the mission. This section can also be used to clarify points in the briefing.
2. SPACE WX EFFECTS: Determine space weather effects using Space Environment information from AFWA. Check the appropriate block indicating the Frequency (FREQ), Global Positioning System (GPS), and Radiation (RAD) as applicable to the specific mission. Indicate the boundaries of the degradation in the remarks section. When using the High Altitude Radiation Dosage Chart, 10.0 to less than 100.0 milirems per hour constitute marginal and 100.0 milirems per hour and greater constitute severe. A second option is to check the appropriate blocks, indicate there are attachments by writing "See Attached" in the remarks section, and attach the applicable Space Weather charts to the AFSOC Form 87.
3. BMNT/SUNRISE/SUNSET/EENT/MOON RISE/MOON SET/ **%** ILLUMINATION: Enter solar/lunar data as required for the flight in zulu. Tailor light data to aircrew needs.
4. SEA STATE/WAVE HEIGHT/SEA SFC TEMPERATURE: Enter pertinent data as required for the mission.
5. PMSV LOCATION/FREQUENCY: Enter Pilot to Metro service location or alternate radio frequency as appropriate.
6. BRIEFING DATA: Enter briefing time in UTC and forecaster's name/initials. Enter time the briefing was provided, and the forecaster's name/initials. Enter your initials legibly. Enter the name/initials of person receiving the brief. For briefings sent electronically, this will be the time the briefing was faxed, posted on a web page, local LAN, or passed to a central dispatch facility. Append an "E" in front of the time (e.g., E1015Z) if the crew was not verbally briefed. If the crew calls later for a verbal briefing, put a solidus after the "E" time and enter the verbal brief time (e.g., E1015Z/1035Z). When briefing Air Force crews there will be no void time. When briefing Army crews the void time will be 90 minutes after the brief.
7. UPDATE: Any updates to the form need to be marked on the form using a green pen or pencil.

Attachment 3

WEATHER FACILITY SITE SURVEYS

The AFSOC Form 84, *Weather Facility Site Survey Form*. This form was developed to provide an easy to use, easy to transmit, standardized collection tool for surveying foreign weather facilities and assessing their capabilities. This form is classified when filled in based on the classification level of the operation or mission being supported. It is utilized during operational preparation of the environment (OPE) missions to provide an assessment of the capabilities and limitations of foreign nations' meteorological services. The data collected is used by operational planners in determining how much confidence to place in the country's weather service reporting and to determine the amount of joint meteorological and oceanographic capability to deploy into the theater. The following provides basic guidance for entries on AFSOC Form 84.

A3.1. General Characteristics.

A3.1.1. SURVEYOR NAME, UNIT, DATE, TIME, TIME ZONE: Keep in mind classification requirements of the document as you fill it out.

A3.1.2. FACILITY NAME/IDENTIFICATION: Provide the common name of the facility and any useful military information about the site as well as the ICAO or WMO number, if applicable.

A3.1.3. LOCATION MGRS/LAT LON: Provide location and map references. Also, as an attachment to this survey provide imagery of the site for reference at a later date.

A3.1.4. ELEVATION: Provide the elevation of the site.

A3.1.5. UNIT ADDRESS: Provide a detailed mailing address to the weather unit.

A3.1.6. LANGUAGES USED: Detail what languages are used at the location and in the surrounding area.

A3.2. Weather Observations.

A3.2.1. RESPONSIBLE AGENCY: If the responsible party for the observations is different than above, provide unit name, mailing address and POC.

A3.2.2. PHONE NUMBER: Include country code and dialing instructions as applicable.

A3.2.3. OBSERVING HOURS: Provide in UTC and local.

A3.2.4. LOCATION OF OBSERVING SITE: Provide MGRS or Lat-Long coordinates of the observing site. Include physical description (i.e. 200 meters west of passenger terminal) and digital photos.

A3.2.5. OBSERVATION CODE USED: Indicate type of observing code, provide an example.

A3.2.6. REMARKS/ASSESSMENT OF OBSERVATION CAPABILITIES: Indicate frequency of observations, confidence in observing capability (not operational, operational with comments, operational), etc.

A3.3. Upper Air.

A3.3.1. Upper Air Capability and System Used: Indicate whether the agency has an upper air capability (which includes understanding the collected information), and what type of upper air system is in use.

A3.3.2. Type of Lifting Agent and Resupply: How is the lifting agent and logistics on hand resupplied? Provide lifting agent used (Helium, Hydrogen, etc.) and type of resupply for lifting agent, sondes, balloons, etc.

A3.3.3. Hours Data Collected and Hours Section Manned: Define the hours of upper air collection operations and hours personnel are on scene in preparing and recovering from the launch, if different than observing and forecasting sections.

A3.3.4. Frequency of Launches: How often does the facility launch upper air systems? Is it a standard timeline or does it vary based on personnel availability?

A3.3.5. Number of Personnel Trained: Indicate the number of personnel who are trained in launching and recording upper air data.

A3.3.6. Telephone Numbers and Email Address: If available, provide data for contacting location.

A3.3.7. Location of the Launch Site with Respect to the Runway: Describe the location of balloon launch facility in relation to the runway.

A3.3.8. Assessment of Upper Air capabilities: Surveyor's confidence in the station's ability to accurately measure and report upper air data (not operational, operational with comments, operational).

A3.4. Forecasts.

A3.4.1. RESPONSIBLE AGENCY: If the responsible party for the forecasting is different than above, provide unit name, mailing address and POC.

A3.4.2. PHONE NUMBER: Include country code and dialing instructions as applicable.

A3.4.3. FORECASTING HOURS: Provide in UTC and local.

A3.4.4. LOCATION OF FORECAST FUNCTION: If not co-located with observing function provide direction and distance. (i.e. 395km east)

A3.4.5. FREQUENCY FORECASTS ISSUED: Provide frequency of forecasts being issued as well as the valid time of the product.

A3.4.6. FORECAST CODE USED: Are there typical TAF's being produced or is it a plain text forecast. If there is something unique, explain what it is and attach an example.

A3.4.7. AREA OF FORECAST RESPONSIBILITY: Explain the area of responsibility for the forecasting unit; is it for the aerodrome, local area, general?

A3.4.8. BRIEFING ABILITIES: Do the forecasters have the ability to provide local flight briefings? Do they have the ability to support international flights?

A3.4.9. ASSESSMENT OF FORECASTING CAPABILITIES: Relay surveyor's confidence in the facilities ability to accurately forecast conditions (not operational, operational with comments, operational).

A3.4.10. MODEL DATA USED: Describe the model data that is locally used/produced and where it comes from. Are these data sources military, commercial or government and are they produced by the host country? Does the weather station use paper or computer based products for forecasting operations? Describe what is locally produced and what is produced elsewhere. If information is produced elsewhere, describe what it is and where it is produced. Provide as much information as possible to regarding weather operations hierarchy.

A3.4.11. REMARKS: Provide any clarifying information about the forecasting section.

A3.5. Communications/Administrative.

A3.5.1. TELETYPE: If yes then determine if it is commercial or military, the number of machines available, speed (bauds per second), point of origin, and whether or not it is interceptable.

A3.5.2. TELEPHONE SERVICES: If yes, is it commercial or military, and does it have secure capability? Is it DSN capable, what are the country codes and any secure information (i.e. how to go secure)?

A3.5.3. WEB/COMPUTER CAPABILITY: Is the unit Internet/world wide web capable? If so, provide website. Where do they go for most of their forecasting, provide website and information on who owns and operates the site. What sort of communication lines does the unit have, is it a T1, cable or DSL capable? How does the unit tie into WMO data or government data sources? Provide diagrams if possible as to how data flows into and out of the unit as an attachment to the survey.

A3.5.4. REMARKS: Provide other significant information on weather communications. Provide surveyor's overall assessment of existing communications: excellent, good, fair or poor.

A3.6. Equipment.

A3.6.1. RADAR: Does the site have radar and if so what is the equipment type, capability and serviceability? It is maintained and do the personnel know how to use it? Where is the system located? On site or off site, distance and access?

A3.6.2. WIND SENSORS: Does the site have an anemometer and if so what is the equipment type, capability, units of measure, serviceability and if it is calibrated? Where is it located?

A3.6.3. TEMPERATURE AND HUMIDITY SENSORS: Does the site have a thermometer for both temperature and dew point, and if so what is the equipment type, units of measure, serviceability and is it calibrated? Where are these sensor(s) located?

A3.6.4. PRESSURE: What is the equipment type that is used for measuring pressure and what units does it measure in and is it calibrated? Where is it located?

A3.6.5. CEILING: What equipment is used for calculating the ceiling and what units does it measure in? Where is the sensor located?

A3.6.6. VISIBILITY: Does the site have Runway Visual Range (RVR) equipment and if so what is the equipment type and serviceability? Are there visibility charts and are they current/representative? Include sensor(s) location, baseline, if applicable, etc.

A3.6.7. OTHER: Is there any other equipment at the site that is used for METOC operations such as a rain gauge, solar incidence, etc?

A3.6.8. REMARKS: Provide other significant info on weather equipment or instrumentation. Is the airfield dual instrumented, etc? Are assigned personnel appropriately trained to use all equipment? If systems are maintained, what is the contractor/organization that performs the calibration and maintenance?

A3.7. Facilities.

A3.7.1. MAN-MADE STRUCTURES AND FACILITIES: State Runway and taxiway geometry, directional headings, buildings and facilities. State the conditions of the buildings and facilities, the perimeter marking (fencing etc.), antennas, vehicles and their condition. Provide a brief narrative of the location of the facilities as well as the manning of the facilities.

A3.7.2. PHYSICAL LOCATION OF WEATHER OFFICE: Describe location (i.e. building/room – passenger terminal, room 101) and apparent space available for co-locating USAF or Joint weather operations.

A3.7.3. ANTICIPATED FACILITY IMPROVEMENTS: State any future improvements that are planned for the weather station to include services or equipment upgrades.

A3.8. On-Site Weather Personnel.

A3.8.1. PRIMARY LANGUAGE: What language do the weather personnel converse in? Do they speak English and if so how well?

A3.8.2. LOCAL WEATHER TRAINING: Where did the local weather personnel learn observing and forecasting? Was it military sponsored training or local government sponsored training? Are they WMO certified? Is recurring training conducted, and if so how often?

A3.8.3. REMARKS: Provide other significant information on the onsite weather personnel and their training. Provide an overall assessment of the onsite weather personnel capabilities.

A3.9. U. S. Embassy/Consulate Information.

A3.9.1. NEAREST EMBASSY/CONSULATE: Provide the name, location, and distance from the weather station. Provide a description and an attached map showing the shortest route with recommended safe areas.

A3.9.2. EMBASSY/CONSULATE ADDRESS: Provide detailed mailing address.

A3.9.3. EMBASSY/CONSULATE PHONE NUMBER: Provide country code and number, also provide DSN number if it has one. State if they have secure capability and instructions on how to go secure, secure numbers, etc.

A3.9.4. AMHS MESSAGE ADDRESS: Provide standard message address.

A3.9.5. REGIONAL SECURITY OFFICER/DEFENSE ATTACHE CONTACT INFO: Provide contact information (name, mail and phone) for the Regional Security Officer or Defense Attaché Officer that has jurisdiction over the site.

A3.10. Physical METOC Features.

A3.10.1. LOCAL TERRAIN: Provide map data and imagery of the site to include digital pictures of local terrain features that affect the weather.

A3.10.2. LOCAL CLIMATOLOGY: Obtain copies of all available climatology on the area from the local weather personnel. See if they have any locally generated and maintained narratives or Terminal Forecasting Reference Notebooks and attach copies to survey, when able.

A3.10.3. OBSERVED REGIME DURING SURVEY: What kind of regime was in place at the time of the survey? Describe indicators of the regime and general impacts to region.

A3.11. Surveyor Remarks. OTHER ITEMS OF SIGNIFICANCE: Provide any other significant information not covered in the above paragraphs. Include items such as POC's in the local area, imagery or drawings of the site and other key sites in the area. Provide an assessment on how indigenous weather personnel seem to view outsiders or members of the U.S. Military, did they seem eager to help or upset that Americans were there.

A3.12. Required Attachments. Check appropriate boxes for attachments to the survey. This allows personnel reviewing the survey to know there are other items attached to the survey to review.

Attachment 4

TACTICAL ENVIRONMENTAL RECONNAISSANCE REPORT (TERREP)

The AFSOC Form 86, *Tactical Environmental Reconnaissance Report (TERREP),* was developed to provide an easy to use, easy to transmit, standardized tactical collection format for critical environmental reconnaissance information from forward areas. The completed form is classified based on the classification level of the operation. It is utilized during reconnaissance operations, patrols and other "outside the wire" operations to provide commanders, battle staff and combat support agencies key information about routes, areas of interest and target areas. It is also used when emplacing unmanned ground sensors to record the location and key terrain surrounding the emplacement site. The following provides guidance for entries on AFSOC Form 86.

A4.1. Pre-Mission Considerations.

A4.1.1. Prior to departing on any ER mission, conduct thorough mission analysis and planning to include:

A4.1.1.1. Identify point of interest. This will include and environmentally significant feature along the planned route as well as the final destination. Consider point of interest that may affect future operations.

A4.1.1.2. Review past products of the area. Include climatology, previously created TERREPs and the current weather pattern.

A4.1.2. Ensure all equipment necessary for TERREP collection is available and operational. At a minimum, this will include:

A4.1.2.1. Digital Camera.

A4.1.2.2. Laser Range Finder (LRF).

A4.1.2.3. Compass.

A4.1.2.4. GPS.

A4.1.2.5. Pen/Pencil.

A4.1.2.6. AFSOC Form 86 (Digital or paper format).

A4.2. Collection and Form Completion. Keep all input in a consistent format. All locations will be identified using, at a minimum, 8 digit grid using the Military Grid Reference System(MGRS). When measuring horizontal or vertical distances, use feet, meters, miles or kilometers but stay consistent throughout the report. Measurement of objects(i.e. trees, rocks or structures) will be completed in inches and feet. Meteorological measurements will be conducted IAW AFMAN 15-111, *Surface Weather Observations*.

A4.2.1. **Location Information.**

A4.2.1.1. Date: Enter date the survey took place.

A4.2.1.2. Location: Enter the location for the survey using MGRS using a minimum 8-digit grid.

A4.2.1.3. Assessment number: Will be left blank.

A4.2.1.4. Person(s) Assessing: List full name and rank of all personnel conducting the assessment.

A4.2.1.5. Elevation: Input the GPS elevation for the TERREP location. Ensure feet or meters is noted and remain consistent throughout the assessment.

A4.2.1.6. Recent Significant Weather: Record a current, full element METAR observation. Provide a detailed overview of recent weather pattern(s) affecting the location being surveyed. Recent significant weather includes and atmospheric phenomena that occurred over the last 48-72 hours prior to arrival at the location.

A4.2.1.7. Plain Text Description of the Area: Describe the location in detail. Significant terrain, vegetation, trafficability and obstructions are factors to consider. Does the terrain provide cover and concealment for enemy forces or provide a feasible over watch site for operations? Provide distance and direction to features from the assessment point using 8 cardinal compass directions (N,NE,E,SE,S,SW,W,NW) or magnetic bearing (120°). For example: A 100x400 meter flat area may provide a good HLZ but a fence row NE of the HLZ is an effective barrier for forces conducting a night assault.

A4.2.2. **Valley/Slope Assessment.**

A4.2.2.1. Grid Point: Enter MGRS location for the assessment point of the valley being surveyed.

A4.2.2.2. Reference Direction: Cardinal direction or magnetic bearing from the location entered in paragraph A4.2.2.1.

A4.2.2.3. Slope Angle and Grade: Input the angle or grade of the valley slopes (degrees or rise over run) using map data, clinometer, or laser range finder (LRF).

A4.2.2.4. Valley Rise/Fall Direction: Input the magnetic direction that the valley floor rises or falls from the point of observation. If the point of observation is in the central part of the valley, provide both rise and fall directions. This can be determined using map data or compass.

A4.2.2.5. Valley Rise/Fall Height/Distance: Provide elevation and distance information on the rise and/or fall of the valley from the point of observation to the top and/or bottom of the valley (i.e. valley floor falls approximately 200 feet over 1000 feet).

A4.2.2.6. Snowline Elevation: Determine the snowline height. Report in Mean Sea Level (MSL). Use map data to improve accuracy.

A4.2.2.7. Wind Channeling (Y/N): Indicate whether or not the valley supports wind channeling.

A4.2.2.8. Significant Weather Impacts: List any weather elements that may impact operations in the valley. Example: Moderate rain may create a potential for mudslides or flash flooding.

A4.2.2.9. Solar/Lunar Impacts: List impacts the terrain has on solar and/or lunar data tables (i.e. terrain delays sunrise by 30 minutes).

A4.2.2.10. Remarks: Use this section to expand on any information in the previous blocks or provide additional information on significant impacts to operations.

A4.2.3. **Water Body Assessment.**

A4.2.3.1. Permanent/Intermittent: Based on size, flow rate or local national input, indicate whether the water body is permanent or seasonal. Satellite imagery can also aid in determination.

A4.2.3.2. Type/Size (Width/Diameter): Indicate whether the water body is lake or river and determine width or diameter using LRF. Satellite and mapping data will aid in this assessment.

A4.2.3.3. Flow Rate: If water body is a flowing river, determine flow rate as close to the thalweg as possible. Use flow meter or timed drift method for this measurement.

A4.2.3.4. Flow Direction: Indicate the direction of flow using cardinal direction or magnetic bearing.

A4.2.3.5. Water Temperature: Determine the water temperature using the flow meter or thermometer. Do not estimate.

A4.2.3.6. Maximum Depth: If possible, measure the deepest portion of the river channel or lake and record its location. Extreme caution must be utilized so as not to risk safety of personnel.

A4.2.3.7. Center Depth: Report center depth using the same method as paragraph A4.4.6.

A4.2.3.8. Bottom Profile: A bottom profile can be conducted while swimming across a water body but is inherently dangerous. It is best conducted near a bridge or using a boat. Using a handheld depth sounder or weighted cord take depth measurements (every 10 feet minimum) while moving across the water body. After measurements are complete provide a sketch of the results.

A4.2.3.9. Bank Height/Slope: Report the height of the bank above the water line and its slope. Report slope in degrees using a clinometer or LRF or using the rise over run method.

A4.2.3.10. Flood Scars and Height Above Water Line: Identify if flood scars are present. Use height of known objects, tape measure or LRF to determine hydrologic and topographic flood plains. Satellite imagery may help in determining flood plains.

A4.2.3.11. Obstacles and Manmade Features: Identify if obstacles or manmade features are present. List and describe each feature.

A4.2.3.12. Trafficability: Estimate trafficability for foot and vehicle traffic. If a crossing is attempted, whether or not it was successful and what type of vehicles, if any, were used.

A4.2.3.13. Impact to population: Identify what the local populace uses the water source for (i.e. drinking water, transportation, irrigation etc.).

A4.2.3.14. Remarks: Use this section to clarify information from previous blocks and provide operationally significant information.

A4.2.4. **Soil Assessment.**

A4.2.4.1. Type: Identify the soil type using the USDA soil texturing field flow chart.

A4.2.4.2. Pack: Identify if the soil is hard packed, loose or spongy.

A4.2.4.3. Frozen: Report if the ground is frozen. Determine frost depth if time permits.

A4.2.4.4. Mud Present/Depth: If mud is present, use a ruler to determine depth.

A4.2.4.5. Snow Present/Depth: If snow is present, measure the depth.

A4.2.4.6. Standing Water Present/Depth: If standing water is present, measure the depth.

A4.2.4.7. Rock Size/Type: If rocks are present, measure the size using a ruler and photograph. If type is known, list it.

A4.2.4.8. Trafficability: Estimate foot and vehicle trafficability. Identify difficulty of movement and list what type of vehicles, if any, were used.

A4.2.4.9. Remarks: Use this section to clarify information from the previous blocks and to provide any operationally significant information.

A4.2.5. **Vegetation Assessment.**

A4.2.5.1. Area Description: Identify the general category of the area (agricultural, forested, plains, desert, mountainous, etc.).

A4.2.5.2. Woody Vegetation Present: Identify trees present. Are they coniferous or deciduous?

A4.2.5.3. Average Height/Diameter: Estimate or use LRF to determine height of tree and report the average. Estimate or measure circumference to determine diameter.

A4.2.5.4. Density: Identify if the foliage or forest density is scarce moderate or heavy. Provide specifics in the remarks block.

A4.2.5.5. Impact to Aviation, Ground or Airdrop Operations: Consider the height of trees, foliage density, time of year, forest density and any other observable hazards. Describe the impacts to operations (i.e. foliage restricts visibility or trafficability, forest can be used for overhead concealment, density restrict rotary wing landings etc.).

A4.2.5.6. Remarks: Use this block to clarify information from previous blocks or to provide additional operationally significant information.

A4.2.6. **Photos.**

A4.2.6.1. Take photos using eight cardinal compass directions or magnetic bearing. Start facing north and progress in a clockwise manner. Take additional photos of operationally significant features.

A4.2.6.2. Record MGRS grid locations and the direction facing for all photos.

A4.2.6.3. Measure distance and direction to significant features using LRF or map data. Identify feature in the photos during TERREP production.

A4.2.7. **Local National Input:** When able, attempt to gain a weather "history" of the region from the local populace. Request information about seasonal patterns and trafficability of the region.

A4.2.8. **Operator Remarks:** Add any plain language remarks that refine or provide further clarification of data contained in the form.

A4.2.9. **Riverine or Avalanche Assessment Attached:** Indicate whether or not other assessments were conducted in conjunction with the TERREP.

Attachment 5

TACTICAL RIVERINE ASSESSMENT

SOWT personnel perform river assessments and reporting in support of military operations at, near and along river systems. Assessments measure critical operational information such as river bank slope, bank classification, soil types, bottom profile, current, depth, and other operational information. The AFSOC Form 85, *Tactical Riverine Assessment*, was developed to provide an easy to use, easy to transmit, standardized tactical collection methodology for river information from forward areas. The form is classified when filled in based on the classification level of the operation. It is utilized during reconnaissance operations, patrols and other "outside the wire" operations to provide commanders, battle staff and combat support agencies key information about rivers within the operations area. The data collected is used by commanders and engineering personnel to determine humanitarian assistance requirements and to support local populace operations (stability operations). It has also proved useful during personnel recovery operations. The following provides guidance for entries on AFSOC Form 85.

A5.1. Planning Considerations. Conduct map and imagery study to determine the most suitable locations within the AO along the river to conduct the assessment. The assessment site should present a reasonable location for the operational mission against which the assessment has been assigned. Review accessibility and trafficability of the assessment site. Utilize the Operational Weather Limiter (OWL) software to determine more specifics on vehicular trafficability considerations. Consider recent precipitation events, current and forecasted weather patterns and regional climatology to access operational risk and determine a favorable period to conduct the assessment. When able, communicate with the local populace in the region to determine recent river irregularities. Personnel conducting riverine assessments must be well trained in collection of operational requirements, confident in the water and utilize protective equipment as required to perform the mission. Rivers are high-threat areas due to clear lines of sight, high human and animal traffic and low ground. Security considerations must be well thought out. Plan for dissemination of collected data to C2 elements, operational levels (i.e. CJSOTF) and strategic levels (23WS, Naval Oceanographic Center) for data basing.

A5.2. Equipment Requirements. The following equipment is recommended to accurately conduct the riverine assessment though it is not all-inclusive:

A5.2.1. **Field Riverine Assessment Kit (FRAK)** consisting of:

A5.2.1.1. Digital Depth Sounder.

A5.2.1.2. SECCHI Disk with 50 foot drop line.

A5.2.1.3. Flow/current meter.

A5.2.1.4. Thermometer.

A5.2.1.5. Clinometer or LRF.

A5.2.2. Digital Camera.

A5.2.3. Static rope long enough to extend across river.

A5.2.4. BAO Kit with appropriate electronic forms and communications software (HPW).

A5.2.5. Kestrel 4500.

A5.2.6. Equipment for water operations to include mask, fins, personal flotation device and wet suit.

A5.2.7. Water-resistant logbook or laminated form and pen/pencil.

A5.3. Execution. Evaluate areas that have potential to support military sized vehicle crossings, engineering operations or other operations as directed. Personnel must have personal flotation, appropriate footwear, and other personal protective equipment in order to prevent drowning or exposure. Personnel entering the water should walk against the current utilizing a wading/hiking pole, swim perpendicular to the current and have a planned entry and exit point for the assessment. Assessors and safety observers should always be aware of hazards such as broken glass, underwater cables, sharp metal objects, and natural items concealed below the waterline. Safety observers must maintain situational awareness in order to assist the assessor, if required. In high-flow rivers, the assessor should be tethered to a safety rope and controlled from the river bank. In order to save time and present usable information, the assessment should cover a 10 meter area along the river, centered on the most useable area. From a tactical perspective, the assessment should occur away from bends in the river.

A5.4. Collection. The following are minimum requirements for thorough River assessment:

A5.4.1. Current River Width: Measured from waterline at each bank.

A5.4.2. Bank Full Width: The width of a river if it is at its peak capacity without the occurrence of flooding.

A5.4.3. Bank Height: Measure the height of each bank from the waterline to the point where flooding could occur.

A5.4.4. Water Depth: Using the depth sounder or SECCHI disk, determine the average and maximum depth across the river.

A5.4.5. Bank Slope: Determine slope using a clinometer or the slope function of the LRF.

A5.4.6. Valley Type or Channel Classification: Determine the valley or channel type using River Channel Classification.

A5.4.7. Bank Profile: Determine the bank profile using River Bank Profile Chart.

A5.4.8. Current Speed and Temperature Measurement: Measure the current strength using the flow meter or by determining the amount of time a floating object takes to drift a specific distance. Determine current at the deepest portion of the river, if possible. Use the flow meter to record surface water temperature. Use the FRAK thermometer to collect sub-surface water temperatures every five feet.

A5.4.9. Soil Type: Determine riverbed soil type (sand, silt, rock etc.) by using a “foot drag” or by using the SECCHI disk to recover bottom material.

A5.4.10. Water Clarity: Determine water clarity using the SECCHI Disk. Lower the disk until it disappears and slowly raise it again until the black and white colors of the disk are visible again. Clarity is reported as the depth at which the disk disappeared.

A5.4.11. Other: Observe the banks for evidence of flood stage (e.g. water marks, erosion and debris lines). Determine mean stage if the river is evaluated to be low.

A5.5. Form Completion. Keep all input in a consistent format. All locations will be identified using, at a minimum, 8 digit grid using MGRS. When measuring horizontal or vertical distances, use feet, meters, miles or kilometers but stay consistent throughout the report. Measurement of objects (i.e. trees, rocks or structures) will be completed in inches and feet. Meteorological measurements will be conducted IAW AFMAN 15-111.

A5.5.1. Location, River and Operator Initials: Provide location using MGRS to a minimum eight digit grid. Provide the local populace name for the river. Provide rank and name or two letter operator initials of the person(s) conducting the assessment.

A5.5.2. Altitude and Sun Angle: Record the elevation where the survey is being conducted in MSL. Sun Angle is the solar incidence angle on the river surface and is optional.

A5.5.3. Recent/Current Weather and Current Observation: Provide a detailed overview of recent weather pattern(s) affecting the location being surveyed. Recent significant weather includes any atmospheric phenomena that occurred over the last 48-72 hours prior to arrival at the location. Record a current, full element METAR observation.

A5.5.4. Area Description: Describe the location in detail. Significant terrain, vegetation, trafficability and obstructions are factors to consider. Does the terrain provide cover and concealment for enemy forces or provide a feasible over watch site for operations? Provide distance and direction to features from the assessment point using 8 cardinal compass directions (N,NE,E,SE,S,SW,W,NW) or magnetic bearing (120°).

A5.5.5. Vehicle Access/Crossable: Indicate whether or not the area can be forded by a standard vehicle, such as a HMMVV or similar system. Make sure to note in the remarks section what type of vehicle was considered when making this determination.

A5.5.6. Depth and Water Clarity: Check the appropriate box based on depth meter or SECCHI disk drop. Refer to A5.4.10 above.

A5.5.7. Width: Measure distance across river using laser range finder, rope length or other methodology.

A5.5.8. Flow Rate (mph, ft/s, kts): Measure using flow meter or alternate method in the most representative location for the flow of the river.

A5.5.9. Temperature (F/C): Measured using thermometer attached to SECCHI disk or other methodology. Measured at three feet and the median depth of the river. Encode each temperature with the sign for the scale used, including the depth of measure with each temperature.

A5.5.10. River Bottom (Rocks, Mud, etc.): Annotate what type of soil or rock is predominant on the river bottom.

A5.5.11. River Bank Slope and Height (left and right): Annotate slope in degrees or ratio format (rise/over run). Bank height is determined based on the depth of the river to the top of the bank, in feet. Evaluate both river banks.

A5.5.12. Mean Water Level: Estimate based on visible erosion and exposed roots, etc, along the river bank. Measured from the river bottom to the visible median point of the exposed terrain. Consider time of year, evaporation and flow when determining MWL. Reported in Feet.

A5.5.13. Flood Levels and Flood Plain: Flood level is the point at which the river overflows its banks. There are two types of floodplain- hydrologic and topographic. The hydrologic flood plain is the area outside of the primary channel but within the banks of the river basin. The topographic flood plain is the highest point that would be inundated with water should the river overflow it's banks (i.e. 100 year or 1% flood plain). Reported in feet and recorded with photography and/or sketches.

A5.5.14. Remarks: Any plain language remarks that refine or provide further clarifying information to data contained on the form.

A5.5.15. Vegetation, Concealment, Camouflage: Report type, color and size of vegetation growing within 10-15 meters of the river bank. Record distance and cardinal direction of any areas visible from the assessment point that provide concealment and camouflage.

A5.5.16. Valley Type. Check the box that most accurately represents the valley type.

A5.5.17. Distinct flat bottom valley? Y/N: Does the river valley have a flat bottom (indicative of slower flowing water)?

A5.5.18. Natural Terraces: Has the river cut out natural terraces in the river bank?

A5.5.19. River Bank Type. Indicate the type of bank of the assessment point that represents the predominance of the river bank for the left and right sides of the river.

A5.5.20. Flow. Check all the appropriate boxes that apply to the assessed portion of the river. If the condition is present, but represents less than 1/3 of the assessed area, it is considered present. If the assessed condition is greater than 1/3 of the assessed area, check the "E."

A5.5.21. Photos. Provide grid location to eight digits. Provide cardinal direction of photo and a brief description. Annotated imagery is encouraged and helpful for later analysis.

A5.5.22. Evidence of Management. Consider manmade impacts to the river system as well as the effect on the local populace.

A5.5.23. Man Made (Bridges, wires, culverts, etc). Includes obstacles to navigation, dangerous terrain encroachments. Features include bridges, bridge footings, anti-navigation cables (cables strung just below the water surface to snag the bottoms of boats, etc), etc.

A5.5.24. Indigenous Remarks. Attempt to gain the river's "history" from the local populace. Questions should include if the river is a line of communication in the region, populace use of the river (water, food, etc), etc.

A5.5.25. End Remarks. Any plain language remarks that refine or provide further clarifying information to data contain on the form. Additional remarks should begin with the section from which they come.